

Appl. No. 09/827,252

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Listing of the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Five Times Amended) An orthopaedic spatial fixation system for holding bone parts comprising a plurality of fixation plates wherein each plate includes a body portion having n [holes] attachment structures positioned therein, whereby said [holes] attachment structures are substantially positioned along an arc of α° of a circle defined by a diameter d, and the [cord] chord length between adjacent [holes] attachment structures is substantially equal to [l] and is substantially equal between all attachment structures, and

$$d \sim l \left(\sqrt{\frac{1}{\sin^2 \left(\frac{\alpha}{2n} \right)} + 1} \right)$$

and whereby the diameter d for each plate within the system is unique, and the value for $n(360/\alpha)$ for each consecutive plate diameter d in the system is a multiple of 3, but is a number greater than 3.

2. (Amended) The orthopaedic spatial fixation system of claim 1 further comprising bone pins for interfacing the bone parts and plates; and,

a plurality of struts that extend between the plates to hold the plates in a selected position relative to one another and relative to the bone parts;

wherein the struts are attached to the plates at the [holes] attachment structures; and,

wherein a plurality of the struts have adjustable length sections for varying the length of the strut to adjust the relative position of the plates.

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3. (Amended) The orthopaedic spatial fixation system of claim 2 wherein the [holes] attachment structures on at least one of the plates are one hundred twenty degrees (120°) apart.
4. (Amended) The orthopaedic spatial fixation system of claim 1 wherein rotation of one plate one hundred twenty degrees (120°) relative to an adjacent plate results in the same alignment of adjacent [holes] attachment structures as before such rotation of the plates.
5. (Amended) The orthopaedic spatial fixation system of claim 1 wherein the plates are symmetrically configured so that if one plate is placed over an adjacent plate, the [holes] attachment structures in each plate can be aligned.
6. (Amended) The orthopaedic spatial fixation system of claim 5 wherein the plates are symmetrically configured so that one plate can be flipped over without affecting the alignment of adjacent [holes] attachment structures.
7. (Amended) The orthopaedic spatial fixation system of claim 2 wherein there are two plates and each plate includes 3 [holes] attachment structures.
8. (Twice Amended) The orthopaedic spatial fixation system of claim 7 wherein

there are six struts each having a first end and a second end;

the first end of each strut is attached to one of the plates and the second end of each strut is attached to the other plate;

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the ends of the struts are attached to the plates at the [holes] attachment structures; and, each [hole] attachment structure accommodates two strut ends, one from each of two adjacent struts.

9. (New) The orthopaedic spatial fixation system of claim 1, wherein the attachment structures are holes.
10. (New) The orthopaedic spatial fixation system of claim 1, wherein the attachment structures are pegs that are adapted to facilitate attachment of an accessories adapted to receive the pegs.
11. (New) The orthopaedic spatial fixation system of claim 1, wherein the circle comprises a groove and the attachment structures are clamps attached to the groove.
12. (New) The orthopaedic spatial fixation system of claim 1, further comprising markings or etches to designate the attachment structure positions.
13. (New) The orthopaedic spatial fixation system of claim 1, further comprising one or more plates being multiple diameter plates having a second set of attachment structures.
14. (New) The orthopaedic spatial fixation system of claim 13, wherein the second set of attachment structures is not spaced according to the diameter equation and chord length limitations.
15. Cancelled
16. Cancelled
17. Cancelled
18. Cancelled
19. Cancelled

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- 20. Cancelled
- 21. Cancelled
- 22. Cancelled
- 23. Cancelled
- 24. Cancelled
- 25. Cancelled
- 26. Cancelled
- 27. Cancelled
- 28. Cancelled
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- 30. Cancelled
- 31. Cancelled
- 32. Cancelled
- 33. Cancelled
- 34. Cancelled
- 35. Cancelled

36. (New) An orthopaedic spatial fixation system, comprising a plurality of arcuate shaped fixation plates, wherein each plate comprises a plurality of attachment structures, at least some of which are (a) in sets of three (b) are spaced substantially 120 degrees apart from each other along an arc of the fixation plate, (c) are substantially equally spaced apart, and (d) have substantially uniform sizes; wherein rotating a first one of the fixation plates substantially 120 degrees from a starting position in a plane substantially parallel to another one of the fixation plates causes the first fixation plate to present the same geometrical arrangement of attachment structures as the geometrical arrangement of the attachment structures of the another plate.

37. (New) The orthopaedic spatial fixation system of Claim 36, whereby rotating the first fixation plate substantially 60 degrees from the starting position in a plane substantially

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parallel to another one of the fixation plates presents the same geometrical arrangement of attachment structures as the geometrical arrangement of the attachment structures of the another plate.

38. (New) The orthopaedic spatial fixation system of Claim 36, wherein the number of attachment points is a multiple of six, providing 2x3 symmetry.

39. (New) The orthopaedic spatial fixation system of Claim 36, wherein at least one of the fixation plates is ring shaped.

40. (New) The orthopaedic spatial fixation system of Claim 36, wherein the plurality of attachment structures is positioned such that in use, at least some of the attachment structures on one of the plates move into alignment with at least some of the attachment structures on another plate as adjustment is effected.

41. (New) The orthopaedic spatial fixation system of Claim 36, wherein the attachment structure are positioned along an arc of α° of a circle defined by a diameter d , and the chord length between adjacent attachment structures is substantially equal to l , and the defined relationship comprises

$$d = l \left(\sqrt{\frac{1}{\tan^2\left(\frac{\alpha}{2n}\right)} + 1} \right)$$

42. (New) The orthopaedic spatial fixation system of Claim 36, wherein the orthopaedic spatial fixation system is adapted to be positioned on a patient.

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43. (New) The orthopaedic spatial fixation system of Claim 36, further comprising six adjustable struts, a first end of each of the struts connected to one of the attachment structures on one of the fixation plates and a second end of each of the struts connected to one of the attachment structures on another one of the fixation plates, wherein the attachment structures connected to struts are each connected to two struts.

44. (New) The orthopaedic spatial fixation system of Claim 36, further comprising six adjustable struts, each strut connected at a first end to one of the attachment structures of one of the fixation plates and each strut connected at a second end to one of the attachment structures of another one of the fixation plates, wherein each attachment structure that is connected to a strut is only connected to one strut.

45. (New) An orthopaedic spatial fixation system, comprising a plurality of fixation plates wherein each plate comprises a plurality of attachment structures, at least some of the attachment structures being in sets of three attachment points, the three attachment structures in a set being spaced substantially 120 degrees apart from each other along an arc of the fixation plate; wherein the plates are adapted to be connected to each other with a plurality of struts such that at least one of the struts connecting two of the plates is not substantially parallel to at least one other of the struts connecting the same two plates, the number of attachment structures on each plate being at least 6 and a multiple of 3, whereby rotating the first fixation plate substantially 120 degrees from a starting position in a plane substantially parallel to another one of the fixation plates presents the same geometrical arrangement of attachment structures as the geometrical arrangement of attachment structures presented to the struts when the first fixation plate is in the starting position.

46. (New) The orthopaedic spatial fixation system of Claim 45, further comprising an accessory adapted to be attached to one or more of the fixation plates.

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47. (New) The orthopaedic spatial fixation system of Claim 45, wherein the orthopaedic spatial fixation system is adapted to be positioned on a patient.

48. (New) The orthopaedic spatial fixation system of Claim 45, wherein the struts comprise six struts, a first end of each of the struts connected to one of the attachment structures on one of the fixation plates and a second end of each of the struts connected to one of the attachment structures on another one of the fixation plates, wherein the attachment structures connected to struts are each connected to two struts.